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ABSTRACT

The Labor Exchange Skills Project, which was conducted under the sponsorship and direction of the U.S. Department of Labor, Employment and Training Administration, was designed to develop a labor exchange skills database (ETA) that would improve the usability of many Department of Labor applications and products developed by other public and private organizations. The new database was based on a database of skill statements that had been developed by the state of Oregon and modified by other organizations. Three part-time occupational analysts and information technology professionals created procedures and edited, analyzed, processed, and organized approximately 4,440 statements, resulting in a usable database of more than 2,300 revised statements linked to multiple O*NET-SOC occupations. The project made a major contribution to the skills component of ETA's Rosetta Project by allowing taxonomic linkages to jobs, resumes, and courses. It also supported intra-ETA collaboration and provided a common linking language for the supply and demand sides of labor exchange. Plans were made to make the labor exchange skills database available to users and system developers, maintain the database's currency over time, develop applications using the data, and continue to improve the database through user feedback. (Example edit review and linkage review files are attached along with a list of linkage review procedures.) (MN)

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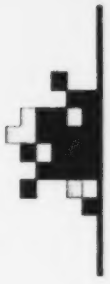

Labor Exchange Skills Project

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Final Report
June 30,2002

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Executive Summary

The Labor Exchange Skills Project, under the sponsorship and direction of the U.S. Department of Labor, Employment and Training Administration (DOL-ETA), was completed June 30, 2002. This labor exchange skills database will improve the usability of many DOL applications, such as the Skills Profiler, the Resume Writer, and the Job Order Writer, as well as products developed by other public or private organizations. Included here are descriptions of the project need, the response to this need, accomplishments and benefits, and recommendations for future work activities on this database and its applications.

★ **Project Need:** DOL-ETA staff recognized a need for statements describing work content/skills at a more detailed level than Generalized Work Activities (GWAs) and less detailed than O*NET-SOC Tasks for use in Career OneStop applications (formerly America's Career Kit (ACK)). A database of skill statements developed by the state of Oregon and modified by other organizations had the potential to meet this need, provided it was revised to eliminate duplication, edited for standard language and clarity, and matched to O*NET-SOC occupations by people familiar with occupational taxonomies.

★ **Response to Need:** A cadre of experienced occupational analysts and information technology professionals were recruited to create procedures, edit existing statements and write new ones, link the statements to O*NET-SOC occupations, process the data, and manage the database. The work team consisted of 3 part-time analysts (approximately 1 full-time equivalent person) plus the assistance of the National Crosswalk Service Center and Fu Associates, working from October 2000 through June 2002.

★ **Project Benefits:** The work team edited, analyzed, processed, and organized several files of approximately 4,400 statements, many of which were unclear or contained duplication, or were linked to only one occupation. The project activities resulted in a usable database of over 2,300 revised statements linked to multiple O*NET-SOC occupations.

Major benefits to ETA include:

- making a major contribution to the skills component of the Rosetta Project, allowing taxonomic linkages to jobs, resumes, and courses
- supporting intra-ETA collaboration with a common language that can be used in its systems, programs and services
- providing a common linking language for the supply and demand side of labor exchange to facilitate effective communication with the business community for the development of a skilled workforce

★ **Recommendations**: Key recommendations for future activities include:
- Make the labor exchange skill statement database available to users, including application developers
- Maintain the currency of the data over time
- Develop applications that use the data
- Continue to improve the product through user feedback, data testing and validation

I. BACKGROUND

The matter of skills information has long been of interest to many parties for many purposes, yet the development of a common definition and ensuing database has remained elusive. Several years ago, the state of Oregon developed a set of skill statements for the purpose of helping a person identify their skills, then match them to occupations. This set of skill statements elicited much national interest. The Oregon skills were developed prior to the release of the initial O*NET program, so they were developed for Occupational Employment Statistics (OES) occupations and based on information from the existing data sources, such as the Classification of Instructional Programs (CIP), the OES occupations, and the Dictionary of Occupational Titles (DOT) attributes.

Once the O*NET database was released, the U.S. Department of Labor was interested in determining how the Oregon skills could be aligned with the O*NET occupations. Two projects developed out of this interest. The first project was carried out by the National O*NET Center in North Carolina. Analysts with the Center reviewed the Oregon skill statements in relation to the major O*NET Content Model constructs, such as Abilities, Generalized Work Activities (GWA), and Work Context. Each Oregon skill statement was related to the elements within these constructs. In general, the Generalized Work Activities were found to provide the predominant basis for relating to the Oregon skill statements.

Once this research was completed, the next step was to use the GWA-Oregon skill relationships as a means of linking the Oregon skill statements to the O*NET occupations, based on the Oregon skills associated with the significant GWAs for an O*NET occupation.

When the Oregon skills were related to O*NET occupations using the above methodology, further analysis at the O*NET task level revealed that there were some significant gaps in skill "coverage" for some of the O*NET occupations. This was essentially due to the fact that the Oregon skills were not developed for O*NET occupations, and that many of the Oregon skills did not get "transferred" over because they fell within GWAs that did not meet the significance level criterion. To fill these gaps, the National O*NET Center contracted with a professor

in Illinois to use graduate students to analyze O*NET occupation tasks as a basis for assigning additional skill statements. As a result, many new skill statements were added to the Oregon skill statement database.

America's Career Kit (ACK) (now Career OneStop), through the America's Learning Exchange (ALX) component, was very interested in using the O*NET-based skills database for connecting available training to the skills for which training was being provided. This interest also migrated into the America's Career InfoNet (ACINet) to help individuals write their resumes and connect their skills to occupations. As ACK investigated the skills database, it became apparent that some further refinement of the skill statements would be needed to make them effective for use in ACK products.

Consequently, ACK, with the support of the National O*NET Center and the National Crosswalk Service Center (NCSC), created a small work group to take the existing skills database, and continue refining the statements to a) enhance cross-occupational skill statement usage, b) ensure coverage of the O*NET tasks, c) eliminate duplication where appropriate, and d) to edit for clarity and consistency. This report describes the procedures and products of this skills refinement project.

II. PROJECT DESCRIPTION

A. Approach

Implementation of the "skills" project began with a discussion of what to call the "skill" statements. Because of their close association with the GWAs, it was decided that they most closely represented work performed, so for this project, they were referred to as work content statements. At the present time, these statements are being referred to as labor exchange skills.

Although labor exchange skills can be used for many purposes, two primary uses were identified to help focus project efforts:

- To assist job applicants in preparing resumes, and
- To assist employers in the development of job orders or position descriptions.

Other supportive purposes may include:

- Job matching,
- Occupational connections to training,
- Searching job orders, and

- Analysis of transferable skills.

The pool of work statements for this project consisted of all of the skill statements developed by Oregon, plus all of the additional statements developed by the Illinois project. The activities of this project broadly consisted of:

- Editing statements to achieve consistency, lack of duplication, and clarity of meaning;
- Reviewing current occupational assignments for appropriateness;
- Identifying statements that should be consistently assigned to occupations within a group of related occupations; and
- Adding additional statements for tasks not currently covered by a statement, either from existing statements in the pool, or by developing new statements.

The activities above were carried out within a set of guiding criteria for each statement:

- It will relate to multiple occupations;
- It will relate to O*NET occupations and the O*NET Content Model;
- It will describe meaningful (critical elements of) work;
- It will neither be too broad nor too specific (between a GWA and task);
- It must have inherent meaning (be able to stand alone).

The project review activities were conducted by a team of 3 analysts, each working part time equivalent to a total of 1.0 full time equivalent (FTE) position. In addition to the review analysts, initial file preparation support was provided by Fu Associates, data processing support was provided by the National Crosswalk Service Center, and project direction was provided by Career OneStop staff at the U.S. Department of Labor. Project activities were initiated in the fall of 2000, and editing and review activities were completed in the summer of 2002.

The scope of the project included the initial extensive editing of approximately 4,400 statements, of which around 2,000 were Oregon skills and the balance were from the Illinois project. Once the edited pool of statements were available, all of the tasks (including the new tasks from NC State University) in each of the 974 O*NET occupations (including the added SOC occupations without tasks) were analyzed with regard to appropriate and complete linkages to statements. The procedures for accomplishing these activities are outlined in the following section.

B. Implementation Activities

The project was conducted in a series of major tasks:

- Task A: File Preparation
- Task B: Statement Editing
- Task C: Occupation-Statement Analysis
- Task D: Statement-Content Model Linkage
- Task E: Product Preparation
- Task F: Final Report

1. File Preparation (Task A)

The preparation of a combined file of Oregon skill statements and Illinois skill statements by O*NET occupation proved to be a complex and large task. The task was performed with extensive support from Fu Associates, support contractor for the ACINet product in Career OneStop. The following steps were carried out in this phase of the project:

- Requested Fu Associates to update the skills file to show O*NET- SOC codes instead of O*NET OU codes. Supplied them with an O*NET OU-to-O*NET- SOC crosswalk to use in this effort.

- Determined the specifications for and requested five specific database reports/files from Fu Associates for project use in reviewing the set of statements and their links to O*NET- SOC.
  - Newskill_ou2onet_comb_rb.xls contained the total set of links of statements to O*NET- SOCs, 18,740 records.
  - Report One contained the unique revised skill statements that were linked to more than one O*NET- SOC.
  - Report Two contained the unique skill statements that were linked to only one O*NET- SOC.
  - Report Three contained a crosswalk of all unique statements by ONET_SOC code.
  - Appendix A contained the changes made to the original statements.

- Reviewed Fu Associates files to determine how to proceed with the project and set up a database of the skill statements and their links to O*NET- SOC.

- Developed 104 broad occupational groups, related to the SOC Divisions and minor groups, and sorted O*NET- SOCs into the broad occupational groups for grouping related occupations for review.

- Developed specifications and criteria for, and created template for reviewing and editing the skill statements and their links to O*NET- SOC within the context of the broad occupational groups. (See Attachments A-1 and A-2 for examples.)

- Once the database was turned over to the National Crosswalk Service Center (NCSC), specifications were developed and implemented, in collaboration with NCSC, for files to be to be supplied by NCSC for use in the review process.

2. Statement Editing (Task B)

The statement-editing phase of the project was conducted for all of the statements that were linked to two or more occupations. The types of edits were divided among the work group members, and each member edited all of the statements for the assigned edit type. An example of the edit worksheet is included as Attachment A-1. The types of edits were as follows:

- ✓ D = Possible Duplication - This statement may be a duplicate of another statement. Indicate which statement(s), if known, by statement code
- ✓ E = General Edit - Other problems exist. Consider alternate ways of writing the statement.
- ✓ MO = Multiple Objects - More than one direct object of the verb is used, creating double meanings/purposes that may cross work areas.
- ✓ MV = Multiple Verbs - More than one action verb is used which may cross work areas.
- ✓ R = Possible Roll-up - This statement has a similar meaning to one or more other statements. Consider combining this statement with the others. Indicate which statements, if known, by statement code.
- ✓ T = Terminology - Words used are not generally understood by the public.
- ✓ U = Unclear Meaning - Statement is vague or ambiguous.
- ✓ V = Verb - Verb used does not convey the precise meaning intended.
- ✓ X = Statement does not indicate need for edit.

Once all the statements were edited, they were combined into one file and the project team met together to review and finalize all of the flagged statements. One of the largest areas needing edit was the Roll-up category, and work in this area continued during the group review, and in subsequent linkage reviews.

3. Review of statement linkages to occupations (Task C)

The review of the linkages between the statements and the O*NET-SOC occupations was the most time-consuming and demanding aspect of the project. The general tasks in this phase of the project included: (See Attachment B for the detailed procedures.)

- *Preparing review files.* A review file was prepared for each work group. Each file consisted of a series of worksheets:
  - A list of the occupations in the work group
  - Where applicable, the NC State tasks linked to occupations in the group
  - Unique statements for the work group
  - Existing occupation - statement linkages
  - Total list of all statements with a number of linkages indicator
  - New statements to be added
  - Review procedures
  - Key for comment, edit, and review actions

- *Identifying and adding statements that applied to multiple occupations in the work group.* These were identified as "G" statements. The purpose for identifying them was to increase appropriate homogeneity and consistency of statement linkages within the work group.

- *Identifying "Keep" or "Delete" statement links.* Statements were compared to the tasks of the occupations and kept or deleted based on the degree of relationship and the relevance to the occupation using the criterion of "meaningful work".

- *Filling gaps in statement linkages.* When tasks were not covered by a statement, additional existing statements were identified and added to the file.

- *Identifying the need for additional statements.* When tasks could not be related to an existing statement, new statements were developed and added to the file if they could be related to multiple occupations.

The following summary describes the steps that were carried out for each of the 974 O*NET occupations:

- Print out the task list from O*NET Online.
- Print out any tasks added from the NC State University file.
- Compare the currently assigned statements to the definitions and tasks and write the statement number by the task statement.

- Enter a "k" or a "d" in the file for the currently assigned statements.
- Identify skill statements for tasks that have no related statement assigned, or which have incomplete coverage, write the statement number on the task list with a plus sign.
- Review the G statements to see which ones should be added and write them on the task sheet with a plus sign.
- Do a key word search of the unique statements worksheet to see if there are other relevant statements that should be included.
- Develop new statements where necessary and enter onto the worksheets.
- Enter all additional statements in the file and mark as "a".

4. O*NET Content Model Linkages (Task D)

The original set of linkages of the Oregon statements to the O*NET Content Model were used as a starting point. Subsequent new or edited statements were reviewed to link them to O*NET domains and elements, using basically the same classification criteria as that used in linking the Oregon statements to O*NET.

5. Product Preparation (Task E)

The main products produced for distribution are:

- The production database of skill statements, linkages to occupations and the relationships to the O*NET Content Model
- The data dictionary which documents the production database.

6. Final Report (Task F)

This final report and executive overview will enhance project continuity by providing historical information and providing a starting "block" for future work.

III. PROJECT RESULTS

A. Benefits and Improvements

This project was undertaken for the purpose of improving the quality of the existing database of skill statements. The database the work team began with had come from two different projects, had been based on different sources of information, and had been developed by a variety of people. This resulted in a need to reduce duplication among statements, assure clarity of meaning, impose

consistency throughout the database (both in terms of language and assignment of statements to occupations), and document the procedures to assure continuity for future activities with the database.

The activities carried out in this project resulted in significant improvements, not only in the database itself, but to the procedures and processes necessary to sustain the information along with its availability and use. The following points outline some of the key benefits and improvements resulting from the project.

★ **Benefits to users**

Perhaps the most important benefit of this project is to support the labor exchange function:

- Individuals and employers will now have a set of previously missing information as a standard, national, integrated resource
- The labor exchange skill statements provide an intermediate level of common language about work performed, a level between the unique detail of occupational task statements, and the broad categories of Generalized Work Activities
- The statements directly support the writing of resumes in consort with occupations, and the development of job orders based on this same language
- The statements have been organized into a taxonomy that allows integration with other taxonomies and systems
- The taxonomy structure provides a common national skill vocabulary, a shared information structure, and hierarchical relationships

★ **Statement quality**

The quality of the statements themselves was significantly improved by:

- Editing existing statements to assure they were clear and understandable
- Using consistent language and statement structure for all statements
- Establishing groups of occupations based on similarity of work performed, which allowed intra-group consistency of statement assignments
- Reducing duplication among similar statements, rolling them up into one statement
- Developing new statements to fill gaps in coverage

★ **Database functionality**

In addition to improvements in statement quality, the usefulness of the statement database was enhanced by:

- Requiring that statements be assigned to multiple occupations for transferability of skills

- Filling gaps where skills had not been previously assigned to tasks, using existing skill statements wherever possible
- Establishing consistent language throughout the database to help relate occupations more effectively
- Eliminating inappropriate occupation-statement linkages
- Significantly increasing the number of linkages between occupations and statements
- Providing an umbrella taxonomic structure based on the O*NET Content Model and a uniform writing style to support additions to the database

★ **Project continuity**

One of the difficulties encountered in carrying out this project was the lack of documentation about how previous versions of the database had been developed, and the ability to track down the different developers to obtain their expertise. With the National Crosswalk Service Center (NCSC) as the repository and distribution point for project procedures and products, the following benefits will accrue:

- NCSC will provide a single authoritative source for the data. This fits within the center's mission of "maximizing the effective and efficient use of occupational information by providing specialized occupational tools (files, reports, software) and technical assistance to users and producers of occupational information." Use of the NCSC as a central distribution point also addresses three of the goals established by the Employment and Training Administration for the NCSC:
  - ✓ Provide a conduit for information and data into and out of the Workforce Information System
  - ✓ Provide a one-stop resource for classification and crosswalk resources.
  - ✓ More fully exploit Internet communication to share files, ideas, feedback, etc. among producers and users of occupational, training and economic information.
- NCSC will house the final project database as well as the historical data
- Experienced national staff are now available from the project and NCSC, and can provide technical assistance and support on future enhancements to the database and its applications
- Documentation of procedures for future update work is readily available and at a single location, available to all users of the database

★ **Interagency Collaboration**

The project represented a collaborative interagency effort between Career OneStop, O*NET, and NCSC, supporting the development of a common database that can be used for multiple purposes:

- Providing resources for ETA initiatives to support the workforce needs of business
- Supplementing the O*NET database
- Supporting interagency collaborative efforts for a common occupational language
- Creating the capability of linking the statements to training curriculum development
- Enhancing Career OneStop's products, such as the Skills Profiler, Resume Writer, and Job Order Writer
- Providing a base for encouraging additional product integration
- Providing ETA with a distribution system for other users through NCSC
- Promoting the use of ETA resources in other systems

★ **Connection to O*NET**

The connection to O*NET was present in all aspects of the project, including linkage of statements to O*NET occupations, examination of task coverage, and the classification of statements by O*NET Content Model elements. Some of the benefits of this approach include:

- Utilizing a common skill language for occupational descriptions
- Filling a skill specificity gap between task and GWA
- Demonstrating a way to connect occupationally related information from outside the Content Model
- Developing labor exchange skills for 74 SOC-based O*NET occupations for which task information was not available
- Providing a more detailed cross-occupational view of O*NET occupations based on similar work performed
- Supporting a new way to look at related occupations in O*NET

B. Scope

The beginning file is the revised Oregon/Illinois Skills Data as processed by Fu for ACK. The product (development) database, which NCSC will house, contains all linkages including those linkages to only one occupation. The production (distribution) database as explained in the data dictionary contains only linkages to multiple occupations.

Scope Statistics

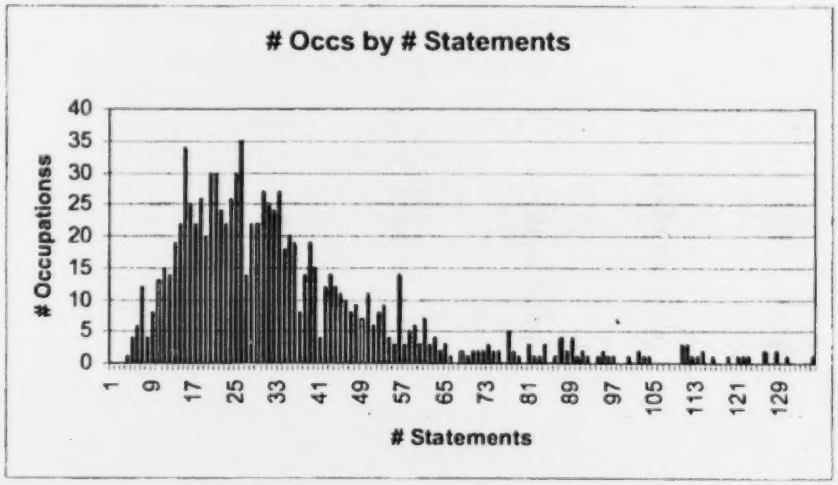
Beginning File	
Total number of occupations	900
Total number of beginning linkages	18,740
Total number of beginning statements	4,372*
Product (Development) Database	
Total number of occupations	974
Total number of linkages	33,488
Number of links to only one occupation	734
Production (Distribution) Database	
Total number of occupations	974
Total number of linkages	32,754
Number of linkages deleted from beginning file	5,574
Number of linkages added (not in beginning file)	19,588
Average number of statements per occupation	33.6
Labor Exchange Statements	
Total number of statements	4,900
Number of new statements	528
Number of statements revised	2,046
Number of statements with links to multiple occupations	2,345
• Number of statements with links to no or only one occupation	2,555

* Number is an approximation due to merger of two source files.

C. Products

1. Database of labor exchange skill statements linked to O*NET occupations

The Labor Exchange Skill Statements database is a relational, normalized Access database. It consists of 4 tables, small enough to be plugged into an application or used alone.



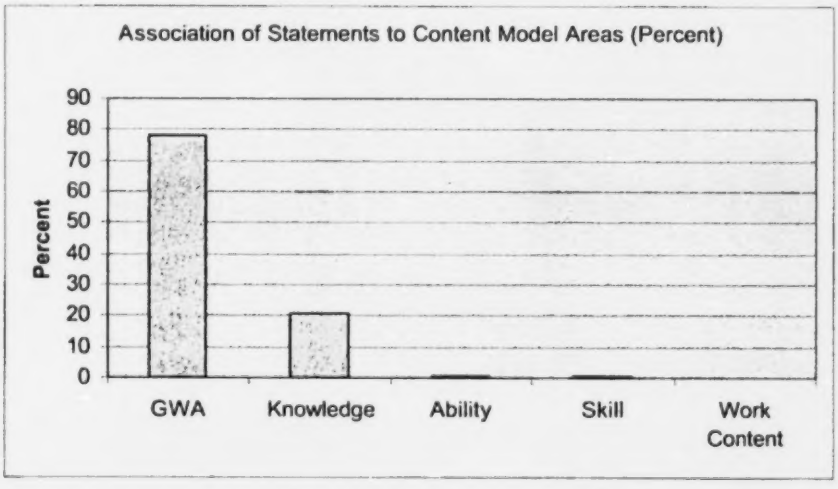
The statements provide concise, consistent and clear descriptions of work performed that can be used in various labor exchange applications. Each statement is linked to 2 or more O*NET occupations, and each O*NET occupation is linked to at least one statement. The statements are written to reflect O*NET tasks at a less detailed level.

2. Classification of Statements by O*NET Structure

One of the basic assumptions of the APDOT Panel was that there was a hierarchical continuum of skills in terms of specificity going from the very general to the very specific. This was reflected in their final recommendations by the inclusion of the Occupation Specific Information domain in the Content Model. The Labor Exchange Skills would fit within this continuum at a level below the domain element level, e.g., the GWA element level, and above the specific task level, as illustrated in the figure below.

GWA element 27 – Communicating with persons outside organization
Labor exchange skill 4189 – Answer customer or public inquiries
O*NET-SOC occupation 43-4121.00 Library Assistants, Clerical-
Task: Answers routine inquiries and refers patrons who need professional assistance to Librarian.

Almost 80% of the labor exchange statements are linked to GWAs, which reflects the relationship between the O*NET-SOC occupation task statements that were used for this project and the nature of the labor exchange skills developed. The remaining approximately 20% of the statements reflect employer requirements, the majority of which were carried over from the Oregon material. These statements reflect such things as machines, tools, equipment and work aids; knowledge; work context; and specific skills or abilities.



Building on the work done in the prior project of linking Oregon statements to the Content Model, a determination was made for each statement as to what type of statement it was and the statement was then classified to an O*NET element accordingly. To help manage and control the possibility of redundancy of statements, each of the work content statements were sorted into one of five groups by statement type, based upon the content and meaning of the statement. The statements within these type groups were then classified to specific domains and elements within the O*NET Content Model. The five types of statements reflect:

- what work activities someone needs to perform (ACK Work Performed Statements),
- what someone needs to know to do the work (ACK Knowledge Statements),
- what work aids someone needs to use in the work (ACK Work Aid Statements),
- what special skills or abilities someone needs to do the work (ACK Work Requirement Statements), and
- what special situations someone needs to adapt to in the work (ACK Work Context Statements).

3. Project Procedures

Procedures for the review of the statement linkages to O*NET occupations were developed for Task C of the project to provide a systematic, replicable process of review. The statement link files for review were developed and organized to conform to the needs of the review procedures. Each file to be reviewed was broken down into nine worktables, each tab of the file contained information relevant to a step in the review process. Over the course of the review phase, the same file structure and procedures were used. See Attachment B for a copy of the detailed procedures that were used.

4. Data Dictionary

The Data Dictionary is a document that describes the structure of the self-contained database storing the statements and their relationships to the occupations defined in O*NET. The document will be available in electronic format on the NCSC web page for this project.

5. Database Processing Procedures

The nature and amount of the work to be done on this project and the skills of those involved dictated a sharp division of labor. Links between occupations and statements were reviewed, changed, deleted and added by a team of three occupational analysts, each working separately. Staff of the National Crosswalk Service Center (NCSC) consolidated the work of the analysts and applied changes to the existing database of occupation-statement links. This section describes the files furnished by the analysts to the NCSC and the steps undertaken to produce production files. Since changes to the database generally fell into a limited number of types, the manipulation of the analyst data followed the same series of steps with each revision. Manipulation of the data can be described through the following steps:

a. Pre-Processing

Changes for incorporation into the database were furnished to the NCSC in the form of MS Excel spreadsheets. The variety of changes was represented in different fashions. NCSC staff consolidated the files produced by the three analysts, ensuring uniform variable names, types, widths, etc. Once that was complete, the spreadsheet files were imported into a series of MS Access data tables. In addition, the previous master file was incorporated into the database to provide a baseline to which the changes were applied.

b. Processing

SAS/PC software was used for most of the file manipulation involved in the creation of new master occupation-statement files. The software was also used to generate counts of the number of occupations related to each of the statements.

1) Read the files: prior master file, rewritten statements table, new statements table and rollup (reassignment to another existing code) table.
2) Apply rewrites to the prior master file.
3) Create a statement title table by combining the codes and titles from the modified master file with the new statements table.
4) Apply rollups to resulting table. (NOTE: it's possible that an existing statement may have been reassigned to multiple statements. Up to three reassignments were allowed for each statement. Most were reassigned to only one.)
5) Add O*NET and statement titles to the file.
6) Remove multiple occurrences of occupation-statement combinations.
7) Generate the variables that allow for calculating occupation counts by statement in a subsequent program.

c. Testing

While the same processing flow was generally applied to a new set of files, subtle differences from one set of files to the next sometimes resulted in an incomplete application of the intended changes. For this reason, a variety of tests were applied to verify that all of the intended changes were made to the database, including:

1) A sample of all new statements, rewritten statements and rollups were examined individually to ensure that the intended changes had been made.
2) The record count of the new master file was compared to the record count expected when applying the count of new statements, recodes and deletions to the old master file.
3) Counts of the number of occupations assigned to statements in the old and new master files were compared to check for anomalies.

d. Adjustment

Causes for any anomalies were identified and addressed in the SAS program that produced the file. The program was rerun, and the results were tested again. This process was repeated until no anomalies were identified.

e. Post-processing

Once the new master database was finalized, counts of the number of occupations assigned to each of the statements were developed, and ancillary files were developed and added to the database for delivery to ETA.

IV. RECOMMENDATIONS FOR FUTURE WORK

Project recommendations for future work emphasize: (A) making the work content (or labor exchange skills) statement database available to users and system developers, (B) maintaining the currency of the statements over time, and (C) developing applications that utilize the database. Further recommendations include: (D) continuing to refine the quality of the database, (E) incorporating feedback from users, (F) enhancing the validity and usability of the statements, and (G) integrating the database with other current taxonomies and databases.

A. Make the labor exchange skills database available to users and system developers.

Making the statements database available is the first priority, so that it can be used in various applications, including those being developed by the Career OneStop as well as Career Information Delivery Systems (CIDS) and other developers. It is recommended that the National Crosswalk Service Center (NCSC) be the repository of this database, and that NCSC be charged to distribute the data to users.

NCSC would establish a page on their website for the purpose of distributing the project report, prototype products, and procedures for other Career OneStop databases. NCSC would also notify potential users of availability, serve as a receiving point for updates, and assist in beta testing of applications that utilize the database.

B. Maintain the currency of labor exchange skills database.

The second priority is setting up a system to ensure that the statement database will be maintained over time to reflect changes in the labor market as well as O*NET, SOC, and other applications. We already have a team of seasoned occupational researchers who can continue maintenance of the data; whoever does this work will need considerable understanding of occupational information systems.

Examples of the tasks required to maintain currency include:

- Work with employers to verify the legitimacy and usability of statements and to solicit suggestions for new statements or links to existing statements.
- Compare the labor exchange skill statements with those in the current Oregon system to identify possible enhancements.
- Examine the use of AJB transaction data.
- Use information gleaned from professional associations and Internet sources.
- Keep up to date with O*NET changes in occupational data, including results of employer surveys.
- Create tools for authoring and maintenance.

C. Initiate the development of applications that use the database.

For the labor exchange database to be useful, it must become part of tools and applications that make the data available to users. Proof of concepts should be developed and tested for various applications. Ideas in this context include:

- The Career OneStop Skills Profiler,
- Resume Writer, and
- Job Order Writer.

D. Continue to refine statement style, content, and links to occupations including:

- Identifying and filling gaps in task coverage.
- Identifying duplication in statements and similar verbs and rolling up into combined statements.
- Refining use of language to clarify statements and distinguish statements from each other.
- Refining and finalizing the existing style guide to improve consistency of statements.

E. Continue to improve project products through feedback from users.

- Solicit systematic feedback from Career Information Delivery Systems and participate in a preconference session at the ACSCI annual conference.
- Evaluate additional needs based on ACK application results, Search work; and user feedback mechanisms.

F. Continue to improve the quality of project products through:

- Empirically evaluating and testing the links between the statements and the O*NET Content Model and revising the links where necessary.
- Rating the GWA linked statements on the GWA scale of importance, running a comparison of these statement scale ratings for the GWAs within O*NET-SOC occupations against the current significant GWA ratings of importance for the O*NET-SOC to see if all of the important GWAs for the occupation were captured.
- Conduct a keyword analysis to identify patterns that would be useful in updating strategies, bridging to AJB transactional data, and helping users access statements.
- Create an access strategy considering factors such as keywords, Content Model structure, and occupational work groups.

G. Integrate the database with current taxonomies and databases.

- Refine current O*NET Content Model relationships and update for version 4.0.
- Examine how the labor exchange skills taxonomy could link to CIPs and the DOE career clusters.
- Compare the statements to the Computer Skills database to fill gaps, eliminate duplication, and integrate the two databases where possible.
- Link the skill statements to the O*NET-SOC tasks to develop a vertical integration from the generic GWAs to the task statements.
- Analyze how the statements are distributed within the Content Model constructs to see if all of the links and statements should be retained or modified, or if there is a need for clarification of elements of the Content Model.
- Examine how the statements fit into all of the other types of O*NET data; look for gaps; look for intra-occupation consistency; use sample profiles to start with.
- Make a part of linking the languages of work, learning, and skills (e.g., as in the Rosetta Project).

Attachment A-1

Edit Review File Example

t_cd	Ack_cd	Ack_statement	CNT	E	T	MO	Comments	Proposed Change
2WP	6726	operate vehicles in law enforcement setting	2				d	
2WP	6737	monitor order and court procedure in courtroom	2			mo	simplify	
2WP	6746	patrol premises	2				d	
2WP	6770	instruct participants in recreational activities	2					
2WP	6771	supply animals with food, water, and personal care	2	e			rewrite	
2WP	6772	handle animals	3					
2WP	6776	test machine functions	2	e			meaning?	
2WP	6784	replenish supplies of food, tableware and linen	4			mo	rewrite	
2WP	6793	garnish and position food on table for convenience in serving	2	e			too long;broaden	
2WP	6799	cut, trim, and prepare carcasses for sale or food service	2	e			broaden	
2WP	6800	order supplies for menu	3					
2WP	6803	weigh, measure, and mix ingredients	6	e			too broad	
2WP	6805	clean, cut and cook meat	2					
2WP	6808	cook food requiring short preparation time	2					
2WP	6812	maintain kitchen equipment	2					
2WP	6814	place food and beverage items on tray or in bag	2	e			rewrite	
2WP	6828	prepare dental charts for practitioner	2	e				prepare dental charts
2WP	6830	record medical information in chart	2					
2WP	0002	access media advertising services	10					
2WP	0003	access social service resource providers	13	e			access?	
2WP	0004	achieve special camera effects	3					
3KP	0005	adhere to government aviation regulations	2					

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Linkage Review File Example
Employment Interviewer

Attachment A-2

WpGrp_cd	onetsoc_cd	Ack_cd	Ack_statement	Action a/k/d	COUNTER	ROLLUP1	Comments
1350	13-1071.01	0140	apply counseling techniques	a			
1350	13-1071.01	0239	apply interviewing skills	k	71		G
1350	13-1071.01	0348	apply psychological assessment tools	a			
1350	13-1071.01	0433	assess staff or applicant skill levels	a			
1350	13-1071.01	0917	interview job applicants	a			
1350	13-1071.01	0932	maintain records, reports, or files	a			
1350	13-1071.01	1357	fill out business or government forms	k	49		G
1350	13-1071.01	1375	apply customer service techniques	k	101		G
1350	13-1071.01	1461	refer clients to community services	a			
1350	13-1071.01	1760	apply knowledge of investigation techniques	a			
1350	13-1071.01	1960	implement recruiting procedures	a			
1350	13-1071.01	2019	edit written material	d	22		
1350	13-1071.01	2081	make presentations	d	142		G
1350	13-1071.01	2116	arrange teleconference calls	d	14		
1350	13-1071.01	2147	hire, discharge, transfer, or promote workers	a			
1350	13-1071.01	2151	evaluate information from employment interviews	a			
1350	13-1071.01	2164	maintain appointment calendar	d	13		
1350	13-1071.01	2165	prepare or maintain employee records	k	34		G
1350	13-1071.01	2166	maintain file of job openings	k	16		G
1350	13-1071.01	2170	maintain job descriptions	k	18		G
1350	13-1071.01	2205	publicize job openings	k	12		G
1350	13-1071.01	4088	obtain information from individuals	a			
1350	13-1071.01	4209	select applicants meeting qualifications	a			
1350	13-1071.01	5053	evaluate applicants' qualifications	k	2		
1350	13-1071.01	5055	contact employers to solicit orders for job vacancies	k	1		

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Attachment B

Linkage Review Procedures (Task C)

1. Review O*NET-SOC links in the work group to become familiar with the occupations in the group.

2. Print out O*NET Online tasks for each occupation in the group.

3. Review the NC State tasks linked to each occupation being reviewed. (Not all occupations will have NC State tasks.)

4. Review the statements and statement frequencies for the group to identify group patterns. Identify statements that represent the broad occupational group and should apply to many of the occupations in the group. These statements need to be ones useful in resumes and job orders. Consider factors such as knowledge and activity type, usefulness, and consistent group pattern application.

5. For any statement selected in Step 4, enter a "G" in the Group Statement column on the Unique Statements worksheet.

6. Add any comments needed in the Comments column concerning the statement or link.

7. For any statement that needs to be changed or edited, go to Step 18.

8. Print out the group of identified "G" statements from the Unique Statements worksheet. Review the "G" statements and the statement links for each occupation on the Add "G" and Fill Gap worksheet to see if group patterns are applied consistently, considering factors such as knowledge and activity type. Review the definitions and tasks for each occupation in the group and compare these to the list of current O*NET-SOC-to-statement linkages on the Add "G" and Fill Gap worksheet to determine if a specific "G" statement should be added to a specific occupation.

9. If a "G" statement should be linked to an occupation, insert a row for that occupation on the Add "G" and Fill Gap worksheet, copy and paste the onetsoc_cd, ACK_cd, and ACK_statement in the corresponding columns, and enter an "a" in the Action column.

10. Enter any comments in the Comments column, including reference to the task number or the reason for the decision.

11. Review statements linked to each O*NET-SOC on the Add "G" and Fill Gap worksheet for the "meaningful work" criterion and compare them to the occupation definition and tasks to decide whether to keep (k) or delete (d) the link. The phrase "meaningful work" as it applies to the work statements will refer to the specific skills, knowledges (either declarative or procedural), work performance experience, personal qualities, and/or capabilities that are considered important factors in performing specific work. This decision may need to be at a very general level so analyst judgment will be required. The purpose of this step is to refine the currently assigned statements so they will reflect only those statements that are central to the work performed in that occupation.

12. Enter "k" or "d" in the Action column for each statement link to indicate whether to "keep" or "delete" the link to the O*NET-SOC.

13. Enter any comments in the Comments column, including reference to the task number in the O*NET-SOC or the reason for the decision.

14. Review the statements on the Add "G" and Fill Gap worksheet for each occupation in the group and compare them with the tasks in O*NET Online and the NC State tasks for the occupation to identify significant work content for the occupation that is not reflected in the statements currently linked to the O*NET-SOC ("missing" content).

15. For each task identified as "missing", review the statements on the Unique Hold File Statements worksheet to identify a statement that represents the "missing" content. These added statements need to be ones useful in resumes and job orders. Consider factors such as knowledge and activity type, usefulness, and consistent group pattern application. If the "missing" content cannot be found in the Unique Hold File Statements worksheet and seems to be able to be linked to other O*NET-SOCs, go to step 19.

16. For any statement selected from the Unique Hold File Statements worksheet in step 15, add a new row for the occupation on the Add "G" and Fill Gap worksheet and copy and paste the onetsoc_cd to the row. Then copy and paste into this row from the Unique Hold File Statements worksheet the ACK_cd and the ACK_statement in the corresponding columns, and enter an "a" in the Action a/k/d column.

17. Add any comments needed in the Comments column concerning the statement link or group. If a statement needs editing or rollup, go to step 18.

18. To flag statements on the Unique Hold File Statements worksheet that need changes, rollups, or edits, enter a "T" in the Proposed Edit Flag column, and in the Comments column, enter the action you think needs to be taken.

19. When the need for a new statement is identified, reference the O*NET-SOC and the source of the "missing" information. Enter the onetsoc_cd for the occupation in the onetsoc_cd column.

20. Cut and paste from the O*NET Online or the NC State tasks into the "NC State or O*NET Online task" column, the task for an occupation that suggests a new statement needs to be written and for which no similar statements exist in the Unique Hold File Statements worksheet.

21. Enter in the Task Source n/o Column either "n" (NC State) or "o" (O*NET) for any tasks entered to indicate the source of the task.

22. If a new statement can be written and linked to more than one occupation, add the statement and links to the Add "G" and Fill Gap worksheet by a) adding a row to the worksheet for the statement (for each occupation), b) cutting and pasting WpGrp and onetsoc_cd into the columns, c) creating a new four character ACK_cd with the analyst initials in it (e.g., bp01) and entering it into the ACK_cd column, d) writing the new statement in the ACK_statement column, and e) adding an "a" to the Action a/k/d column.

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